

REMARKS

1. After entry of this paper, claims 1-8, 10-18, and 20 are pending.
Reconsideration of the application is respectfully requested.
2. Restricted claims 21 and 22 have been withdrawn from consideration by the Examiner. Accordingly, claims 21 and 22 are cancelled herein without prejudice or disclaimer of the subject matter contained therein. The Applicants reserve the right to refile and prosecute the subject matter of claims 21 and 22 in a divisional application.
3. Claims 1-3, 9-13, 19 and 20 stand rejected under 35 U.S.C. 102(a/e) as being anticipated by U.S. Patent 6,651,287 to Oikawa et al. (Oikawa). Claims 4-5 and 14-15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Oikawa. Claims 6-7 and 16-17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Oikawa. Claims 8 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Oikawa.

The claims now require, inter alia, "... a calibration unit of a thickness substantially identical to that of a wafer to be cleaned; at least one light source positioned to generate at least one light beam across a surface of the calibration unit in a plane substantially corresponding to the surface of the calibration unit"

In contrast, Oikawa describes a light-emitting device 27a and a light-receiving device 27b disposed on opposite sides of a standby position 2 of a cleaning member 21, which is attached to a pivot arm 23. The light-emitting device 27a and the light-receiving device 27b detect whether the cleaning element 21a has fallen off or been removed from the holding element 21b of the cleaning member 21. The light-emitting device 27a and the light-receiving device 27b are connected to the pivot arm 23 by support members 41 and 42.

The support members 41 and 42, identified by the Examiner as a calibration unit, are not described, taught or suggested as being of a thickness substantially identical to that of a wafer to be cleaned. Oikawa also does not expressly or inherently describe that the standby position is a calibration unit. Further, Oikawa does not describe, teach or suggest that the standby position has a thickness substantially identical to that of a wafer to be cleaned. Still further, Oikawa does not describe, teach or suggest that the light-emitting device 27a is positioned to generate at least one light beam across a surface of a calibration unit of a thickness substantially identical to that of a wafer to be cleaned, in a plane substantially corresponding to the surface of the calibration

unit.

For at least the above reasons, the claims are allowable over Oikawa. Hence, withdrawal of the rejections using Oikawa is respectfully requested.

4. Claims 1-3, 9, 11-13, and 19 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,947,134 to Kim et al. (Kim).

The claims now require, inter alia, “. . . a calibration unit of a thickness substantially identical to that of a wafer to be cleaned; at least one light source positioned to generate at least one light beam across a surface of the calibration unit in a plane substantially corresponding to the surface of the calibration unit”

In contrast, Kim describes a distance sensor 38 including a light-emitting portion 31 that casts a laser light pulse onto the top surface of a wafer 10, and a light receiving portion 32 that senses the laser light pulse reflected from the top surface of the wafer.

The Examiner contends that Kim’s rotary chuck 11 is a calibration unit, however, the light-emitting portion 31 of Kim is not positioned to generate at least one light beam across a surface of the chuck 11 in a plane substantially corresponding to the surface of the chuck. Moreover, Kim does not expressly or inherently describe that the chuck 11 is of a thickness substantially identical to that of a wafer to be cleaned.

For at least the above reasons, the claims are allowable over Kim. Hence, withdrawal of the rejection using Kim is respectfully requested.

5. Claims 1-5, 9-15, and 19-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002313765 to Kasashima in view of U.S. Patent 5,375,291 to Tateyama et al. (Tateyama). Claims 6-7 and 16-17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kasashima in view of Tateyama. Claims 8 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kasashima in view of Tateyama, and further in view of Oikawa.

The claims now require, inter alia, “. . . a calibration unit of a thickness substantially identical to that of a wafer to be cleaned; at least one light source positioned to generate at least one light beam across a surface of the calibration unit in a plane substantially corresponding to the surface of the calibration unit”

In contrast, Kasashima describes a pressure sensor 132 located in a brush 130 for determining when the brush contacts the surface of a wafer 110. Tateyama describes a light-

emitting sensor 71 and a corresponding light-receiving sensor 72 for detecting the presence of a wafer on a wafer spin plate 62 that is rotated by rotating shaft 61, wherein sensor 71 is disposed above the spin plate 62 and wafer and sensor 72 is disposed below the spin plate such that their optical axis is along passage 61a in the rotating shaft 61. Oikawa describes a light-emitting device 27a and a light-receiving device 27b disposed on opposite sides of a standby position 2 of a cleaning member 21, which is attached to a pivot arm 23. The light-emitting device 27a and the light-receiving device 27b detect whether the cleaning element 21a has fallen off or been removed from the holding element 21b of the cleaning member 21. The light-emitting device 27a and the light-receiving device 27b are connected to the pivot arm 23 by support members 41 and 42.

Kasashima in view of Tateyama and Kasashima in view of Tateyama and Oikawa fail to describe, teach or suggest a calibration unit of a thickness substantially identical to that of a wafer to be cleaned and at least one light source positioned to generate at least one light beam across a surface of the calibration unit in a plane substantially corresponding to the surface of the calibration unit, as required by the claims.

In addition, the Examiner proposes to replace the pressure sensor located in the brush of Kasashima with the light-emitting and light-receiving sensors taught by Tateyama because the pressure sensor of Kasashima and the light-emitting and light-receiving sensors of Tateyama are allegedly known art-recognized equivalents. The Examiner, however, does not explain or cite any reference which shows how such totally different sensors are known equivalents in the art. Furthermore, it is doubtful that one of ordinary skill in the art would have selected a light sensor arrangement, instead of a pressure sensor, in order to detect the pressure applied to the wafer by the cleaning brush in Kasashima.

The Examiner also proposes positioning the light-emitting and light-receiving sensors taught by Tateyama horizontally along the wafer rotating mechanism of Kasashima so that the brush of Kasashima will interrupt the light emitted by the light-emitting sensor when the brush moves vertically. The Examiner, however, does not provide any reference which teaches or suggests positioning the sensors in the manner proposed by the Examiner. Thus, the Examiner's proposed modification of Kasashima in view Tateyama without a reference, is merely an impermissible hindsight reconstruction of the Applicants' claims using the Applicants' disclosure as a blueprint for the modification.

For at least the above reasons, the claims are allowable over Kasashima in view of

Tateyama and Kasashima in view of Tateyama and Oikawa. Hence, withdrawal of the rejections using Kasashima in view of Tateyama and Kasashima in view of Tateyama and Oikawa is respectfully requested.

6. Favorable reconsideration of this application is respectfully requested as it is believed that all outstanding issues have been addressed herein and, further, that claims 1-8, 10-18, and 20 are in condition for allowance. Should there be any questions or matters whose resolution may be advanced by a teleconference, the examiner is cordially invited to contact the undersigned attorney at his number listed below.

7. The Director is authorized to charge any payment required under 37 CFR 1.16 and any patent application processing fees under 37 CFR 1.17, which are associated with this paper, or credit any overpayment to Deposit Account No. 04-1679.

Respectfully submitted,

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